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Combat Crew

strategic air command

JANUARY 1987

G ★★★★

The Future of SAC

Where SAC is Going

**GENERAL JOHN T. CHAIN, JR.
COMMANDER IN CHIEF
STRATEGIC AIR COMMAND**

Right now, you, or one of your contemporaries, is on alert with a Peacekeeper, B-1B, or KC-135R. That's just one illustration that SAC is gaining new capabilities and moving in new directions. We're entering a dynamic, exciting era in the command. The articles in this issue give you a good look at where we're heading.

First, we're modernizing, which Gen McCarthy's article discusses. The road map for modernization comes directly from the President. Completing the modernization program will ensure credible deterrence well into the 21st century.

We've started with sensible, cost-effective upgrades to existing forces — many of which are in place now. New systems are deploying. Over the next couple years, we'll achieve full operational capability for B-1B and the first 50 Peacekeepers, complete delivery of our KC-10s, and continue to receive KC-135Rs. We will make these systems fully effective through smart planning and sensible implementation.

Modernization will continue into the 1990s. We propose to complete Peacekeeper deployment in follow-on basing in the early 90s, with Small ICBM and the Advanced Technology Bomber on track for early 90s deployment also. At the same time, we'll be adding the C^3I enhancements needed to ensure effective force management. Gen Goetze shows that modernization provides the forces that can fully execute the employment tasks required in the SIOP.

New hardware is only part of the story. We're also moving in new operational directions, and exploiting SAC's immense potential for conventional operations. As Gen Shuler points out, the quantity, intensity, and realism of conventional training will increase with all bomber squadrons having conventional responsibility. We'll get new weapons delivery capabilities in the near-term, and are working a number of initiatives to accelerate development and deployment of precision standoff munitions.

With that much ahead, all of us in SAC will have to work smarter — not harder. We're decentralizing, giving the stick to those who can do the job at the lowest level possible. A big piece of that effort is Readiness Oriented Logistics System (ROLS), which Gen Doran discusses. We're becoming more responsive. The Model Installation Program has been hugely successful in saving money, and getting the job done better. The Commander's Emphasis Program and Self-Help make good ideas at unit level become reality, as professional facilities are built at substantial savings.

As we move in these new directions, we should not forget that there are certain vital standards that will continue. First, SAC remains committed to professional excellence, and pride in performance. Readiness is essential. We will defend the reliability modifications, spares funding, and flying hours that improve combat readiness . . . and combat readiness is what it's all about in this command. For those who fly, airmanship — the skill and pride one develops by performing the mission in the air with perfection — will continue to be emphasized. For those who can launch our ICBMs, missilier vigilance — the skill and pride one develops by knowing that he or she can launch missiles with perfection — will continue to be emphasized. For those of you who are not flyers or missile launch officers, the same "airmanship" or "missilier vigilance" attitude and approach to your mission are equally important. That's how we can squeeze all the combat capability out of our weapon systems.

Remember that hardware is important, but people are SAC's most important resource. We'll continue to fight for the pay and benefits you've done so much to earn. We'll continue, with your help, to provide professional facilities for our professional people. We'll also do our utmost to grow SAC's next generation of leaders. Your support is essential to that effort. There are twists and turns in the personnel road ahead, as Col McNeil details, but we're committed to providing responsive, caring, professional service to all SAC members and families.

Despite the hard work ahead, we're committed to making the job fun, to creating an atmosphere where everyone looks forward to coming to work. We'll keep letting you know what's happening and how it affects you. This issue of **Combat Crew** is the SAC staff's look at where we're going, and it's part of our effort to keep you informed.

The bottom line is you are all warriors and part of the greatest and most important team on earth — and I want you to be treated with the respect you deserve.

★★★★

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Combat Crew

Magazine of the Strategic Air Command — 37th Year of Publication

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ON OUR COVER

What does the future hold for SAC and how do you fit in? This month Combat Crew takes a peek into the crystal ball.

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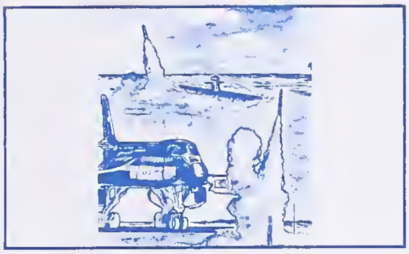

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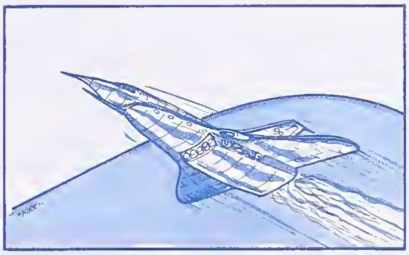

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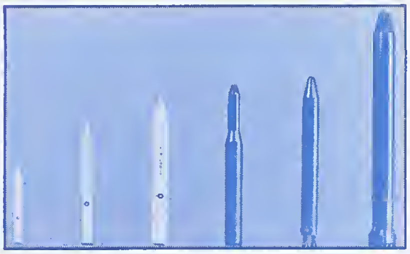

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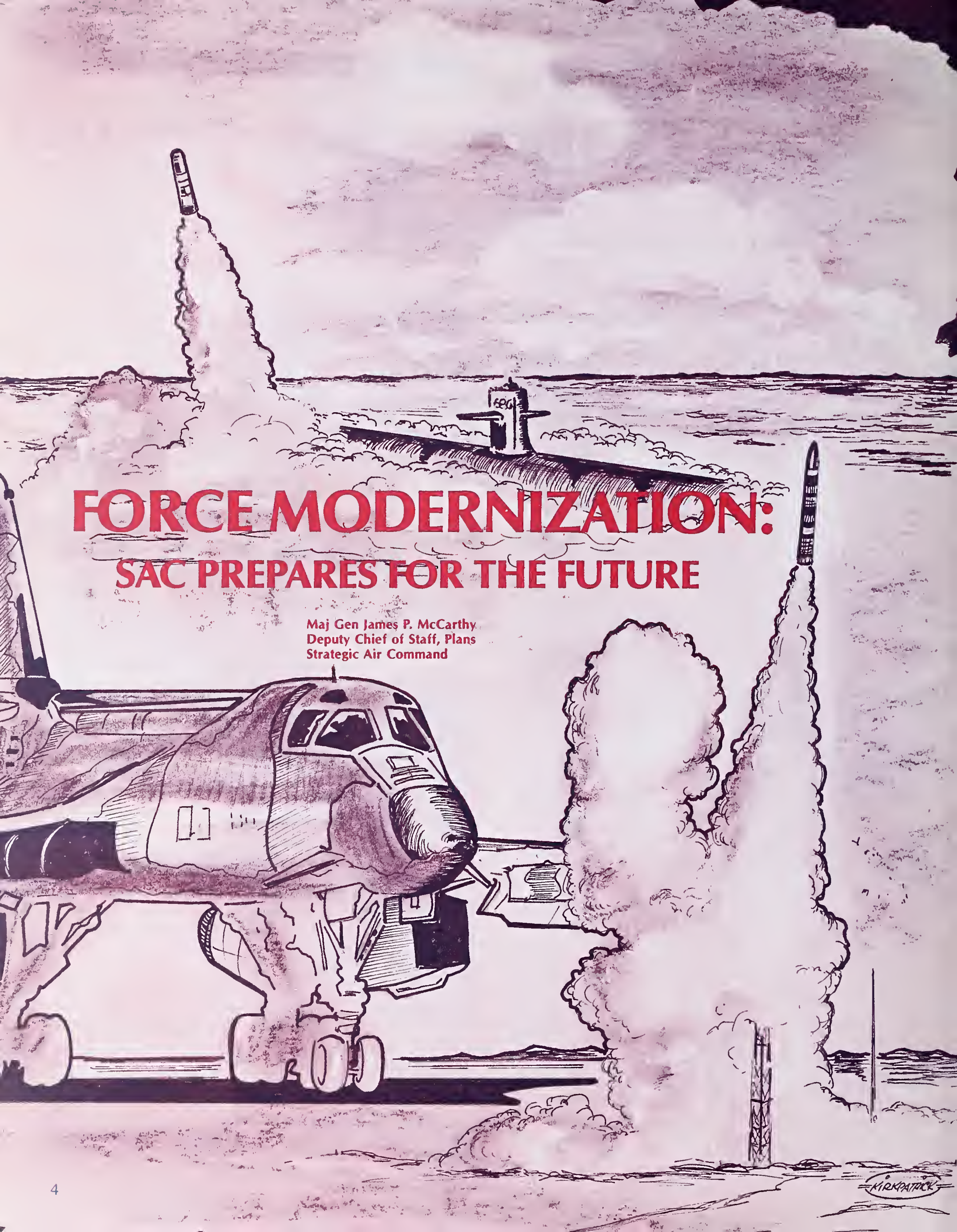
FORCE MODERNIZATION:

SAC PREPARES FOR THE FUTURE

Maj Gen James P. McCarthy
Deputy Chief of Staff, Plans
Strategic Air Command



As a SAC crewmember, you are an important part of one of the most exciting and challenging periods in this command's history. Six years go, we began a sustained drive to improve our nation's strategic forces. We have traveled a long road from the early Congressional debates to the point we are today; tomorrow will be even better. America and world peace will benefit from the President's Strategic Modernization Program. This is because the modernization program, by responding to the relentless expansion of Soviet military forces, is beginning to produce tangible improvements to our deterrent capabilities. Some of you are already involved in efforts to improve our existing weapons systems. Others are working hard to bring our new systems on line. In the near future, still others of you will bring on the high technology aircraft and missiles we are currently developing.

One key improvement our ICBM crewmembers are seeing is the upgrade of MINUTEMAN. While the MINUTEMAN force is over 20 years old, it will remain a vital part of the TRIAD into the next century. MINUTEMAN upgrade programs are being directed first toward improved supportability and maintainability. For example, RIVET MILE corrects the effects that many years of wear and tear have had on our missile launch control facilities and launch facilities. We are also replacing or improving key support elements such as test equipment and transporter erector vehicles. Our plans also call for upgrade of the launch control centers and improvements in the missiles themselves. The launch control centers will be revitalized with upgraded command consoles and integrated communications and weapon system control features. We currently have projects on the drawing board to improve missile accuracy and permit rapid retargeting. Maintaining MINUTEMAN's warfighting capability is an integral part of the ongoing ICBM modernization.

PEACEKEEPER is absolutely essential to our modernization effort. Today, the first 50 PEACEKEEPERS are being deployed in existing MINUTEMAN silos at F.E. Warren AFB, Wyoming. Initial operational capability (IOC) was reached in Dec 1986, with final operational capability expected in Dec 1988. PEACEKEEPER is the first new ICBM since 1970, and its reliable, highly accurate warheads will significantly enhance the deterrent posture of the United States. We have submitted to the Air Staff alternate basing mode concepts to complete the full deployment of 100 PEACEKEEPERS called for by the President's Strategic Modernization Program. We will let you know as soon as a decision is made.

> **"One of the most exciting programs on the horizon is the Advanced Technology Bomber (ATB). The ATB program is on schedule, the technology works, and we expect the system to be operational in the early 1990s."**

As a future complement to other ICBM systems, SAC is working with Air Force Systems Command's Ballistic Missile Office to develop a small, mobile ICBM. Initial deployment of the Small ICBM (SICBM) is planned for late 1992 and will provide survivability and PEACEKEEPER-like accuracy. We're refining system requirements and operational concepts to insure SICBM survival — even after a surprise Soviet attack.

Your aircrew members will also have the opportunity to work with new and upgraded systems. The air-breathing leg of the TRIAD is being improved dramatically. To enhance the combat effectiveness of our existing B-52 fleet, we are pursuing significant modifications and upgrades to increase reliability and maintainability. Many of these improvements, which ensure the continued viability of the B-52, are in progress now. The last B-52 will receive the Offensive Avionics System modification in early 1987. Planned Cruise Missile Integration (CMI) has been completed on 98 B-52Gs and the 96th, and final, B-52H will be finished in early 1990. Starting in 1988, the H model and the Non-ALCM B-52G aircraft will receive the NAVSTAR Global Positioning System (GPS). GPS will improve navigational accuracy by permitting precise worldwide position fixing and alignment via satellite. We are also planning defensive improvements for the B-52 force. The ALQ-117 PAVE MINT, which provides quick reaction electronic countermeasures capability, is currently being incorporated in 156 B-52G aircraft. The ALQ-172, with its phased array antenna, is now being installed on the B-52H. It is even better than the ALQ-117.

While the FB-111 continues to be an excellent penetrator, it, too, requires upgrades. The Avionics Modernization Program, which will provide a 10-fold increase in reliability of critical bombing and navigation components, is now being fielded. Two planned ECM upgrade programs will assure the penetration capability of the FB-111 through the end of the 1990s.

The B-1B is on line and almost a quarter of the fleet has been delivered. The B-1B will insure that our manned bomber force continues to have the capability to penetrate the increasingly formidable Soviet air defense network — at least until the Advanced Technology Bomber is fully deployed. Although delivery of the B-1B fleet will not be completed until 1988, we are planning now to insure its timely modernization to meet future threats. In the near term, we will see the integration of cruise missiles and the addition of survivable low frequency communications capability. Other SAC initiatives include adding a second inertial navigation system, a forward looking infrared system, Global Positioning System (GPS), MILSTAR, and MIL-STD 1760 weapons interface capability. Cost-effective modifications will insure B-1B combat effectiveness well into the next century.

One of the most exciting programs on the horizon is the Advanced Technology Bomber (ATB). The ATB program is on schedule, the technology works, and we expect the system to be operational in the early 1990s. The ATB will possess low observable or so-called "stealth" technology which will make it far more survivable against enemy defenses. Superior survivability, combined with the ATB's payload and range, will substantially increase its military effectiveness over other air breathing strategic systems. The ATB will be our premier penetrator well into the next century.

Our tanker crew members are likewise seeing major improvements in their aircraft. The KC-135R upgrade program will modernize the entire KC-135 fleet and increase the offload capability of the present KC-135A by 50 percent. When the entire fleet of 640 KC-135 aircraft is modified, we will have a KC-135R which is equivalent to 960 of our current KC-135A model tankers — an increase equal to 320 additional aricraft. The KC-135R also has improved takeoff performance, reduced noise and smoke pollution, and consumes 27 percent less fuel. We plan to upgrade KC-135 avionics with an integrated flight management system, to include the highly reliable ring laser gyro inertial navigation system, digital color weather radar, and cockpit multifunction displays to monitor the flight management computers.

By July of 1988, we will receive our sixtieth KC-10, which will complete the fleet. This aircraft's unique capability to carry fuel, as well as cargo and personnel, has been demonstrated during training, exercises, and actual crises. To further improve KC-10 effectiveness, the Com-Nav 50 secure UHF radio, an onboard integral cargo loading system and wing tip hose/drogue refueling pods are planned. The onboard integral cargo loading system will enhance ground loading/unloading operations in the combat theater by eliminating the requirement to preposition aircraft loaders. The addition of wing tip hose/drogue pods will significantly enhance refueling operations with probe equipped receivers, allowing simultaneous refueling of up to three receiver aircraft.

We are also arming our aircraft with better standoff weapons: the Advanced Cruise Missile (ACM) and SRAM II. These weapons with their increased range, greater flexibility, and superior ability to penetrate Soviet defenses, will significantly enhance the combat effectiveness of our bomber force. The ACM will be less observable, have greater range, and will be more accurate than current cruise missiles. The Short Range Attack Missile (SRAM A) has performed extremely well for SAC, but is reaching the end of its design life. SRAM II will provide the greater range and accuracy needed to counter the growing depth of defenses, will enhance routing flexibility, and will be effective against both hardened and relocatable targets. These weapons enhancements enable our bomber force to stand off outside lethal Soviet defenses and attack all categories of Soviet targets.

As many of you know, this Command is increasing the emphasis on conventional tasking and training. All of our bombers are conventionally capable, and our plans call for increasing that capability across the fleet. The B-52 represents a formidable force and can carry a vast array of gravity bombs and mines. We can launch conventionally armed bombers from stateside bases, strike distant targets, and return home without depending on foreign bases. While the Strategic Modernization Program is improving our aircraft, we also need to modernize our conventional weapons to operate effectively against increasingly sophisticated enemy defenses. Today, the all-weather Harpoon missile, with its precision guidance and standoff range, greatly improves our ability to attack maritime targets. We also have both short and long-range plans to increase the lethality and flexibility of our conventional weapons. In the near term, we are looking for a precision guided weapon, with a standoff capability. We are considering a proven system with a point target kill capability that exploits both current and emerging technology.

In addition to new weapons, the new additions to our bomber force will give us added capability and flexibility. The B-1 will be our best penetrator for the near term. With its heavy payload, it will be a superb system in the conventional scenario as well as the nuclear area. Likewise, the characteristics of the ATB, which make it a superior SIOP bomber, will make it an outstanding conventional bomber as well — one that will provide a whole new dimension to our conventional capability.

The combination of modern, high technology weapons and more capable and sophisticated aircraft substantially enhances our ability to provide massive conventional firepower anywhere in the world.

Strategic modernization efforts will continue to improve our combat capability and, more significantly, will strengthen deterrence. The addition of these new weapon systems will create a dynamic environment, one that will be both challenging and rewarding for SAC's people. Modern, highly capable equipment will give you, SAC's professional crew members, the tools you need to carry out Strategic Air Command's global deterrent mission well into the twenty-first century. ★★

Maj Gen James P. McCarthy
Deputy Chief of Staff, Plans
Strategic Air Command

Maj Gen John J. Doran, Jr.
Deputy Chief of Staff, Logistics
Strategic Air Command

(ROLS)

Readiness Oriented Logistics System In SAC

It has been just over a year now since the term ROLS was first heard in the Strategic Air Command. ROLS stands for the Readiness Oriented Logistics System, which is the name given to SAC decentralized aircraft maintenance. ROLS was initiated to meet increased operations sortie requirements by moving decision making authority and resources to the flight line. About a year ago, General Welch, then CINCSAC, authorized three units to develop a decentralized maintenance organization. These units established their own versions of ROLS and operated under those concepts. The units which tested the decentralized concept were the 92 BMW, Fairchild AFB, Washington; 319 BMW, Grand Forks AFB, North Dakota; and 410 BMW, K.I. Sawyer AFB, Michigan. We'll look at each of these units and their versions of ROLS a little bit later.

Once the concept was established and working, evaluations began. A team of headquarters staff personnel visited Fairchild in March to observe and learn. In addition, the Deputy Commander for Maintenance from the 319 and 410 BMWs briefed his ROLS organization to the LG and his staff. A command working group was then formed to recommend a single ROLS organization for SAC. On 2 June, a conference was held at Headquarters SAC, chaired by General Welch and attended by NAF commanders, the three ROLS units, and members of the SAC staff. The ROLS organizational structure was finalized at this conference. Later that month following CINCSAC change of command, the ROLS structure was approved by General Chain before being released to the command. It currently applies to bomber/tanker collocated units at SAC host bases.

Before looking at the finalized ROLS structure, we need to review the three proof of concept bases. Fairchild AFB dissolved the bomber and tanker branches in the Organizational Maintenance Squadron (OMS) and established two Aircraft Maintenance Units (AMUs). It split its bombers and tankers, and assigned equal numbers to both AMUs. It also divided its specialists — hydraulics, electrics, propulsion, bombing navigation, electronic countermeasures, etc. — into on-equipment (works aircraft) and off-equipment (component repair). The on-equipment specialists were then assigned to OMS. Avionics and Field Maintenance Squadrons (FMSs) primarily worked off-equipment component repair. Job Control lost directing authority.

Grand Forks AFB also established two maintenance units in OMS — Bomber Maintenance Unit and a Tanker Maintenance Unit. As evidenced by the titles, Grand Forks kept its bombers and tankers separated in two maintenance units. It also divided its specialists into on- and off-equipment and moved the on-equipment technicians to the flight line. Job Control's role was also reduced.

Finally, K.I. Sawyer AFB left the bomber and tanker branches intact in the Organizational Maintenance Squadron, although each branch did divide into flights to promote competition. Both the Avionics and Field Maintenance Squadrons divided their special-

Under ROLS the new B-52 Bomber Branch — the Red Dragons — at Fairchild AFB has been enlarged with the addition of aircraft schedulers, debriefers and on-equipment specialists from AMS and FMS.

ists into on- and off-equipment, like both Fairchild and Grand Forks Air Force Bases. However, K.I. Sawyer then established a flight line branch in AMS and FMS, moving its on-equipment specialists to these branches. Like the other two units, Job Control's role was reduced.

With these three concepts in mind, I'd like to examine the principles which evolved and that now govern the organization of ROLS in SAC:

a. Large specialist shops with heavy flight line workload will be assigned to OMS.

b. OMS branch/flight chiefs are responsible and accountable for maintenance production.

c. Production Control functions in AMS/FMS are dissolved; shop chiefs are responsible for shop production.

d. Each bomber and tanker branch will have a minimum of two (2) flights.

e. OMS specialists dispatch will be located on the flight line.

f. Maximum possible number of senior supervisors will be moved to the flight line.

These principles provide the basic guidelines for SAC ROLS organizations. From this point, we can take a detailed look at the ROLS organizational structure.

Looking at the maintenance complex from the macro view **(Figure 1),** there are no apparent changes. The Deputy Commander for Maintenance (DCM) is responsible for management of the maintenance complex. There are still four maintenance squadrons: AMS, FMS, MMS, and OMS. Three of these squadrons will be examined in depth for ROLS changes. The fourth squadron — MMS — experiences no organizational changes under ROLS; but some procedural changes will occur due to other organizational changes.

The first changes become apparent when you look at the DCM staff **(Figure 2).** The assistant DCM is responsible for Training, Quality Assurance, and Administration. By administration here, we're referring to administration for the DCM staff. The Assis-

Figure 1.

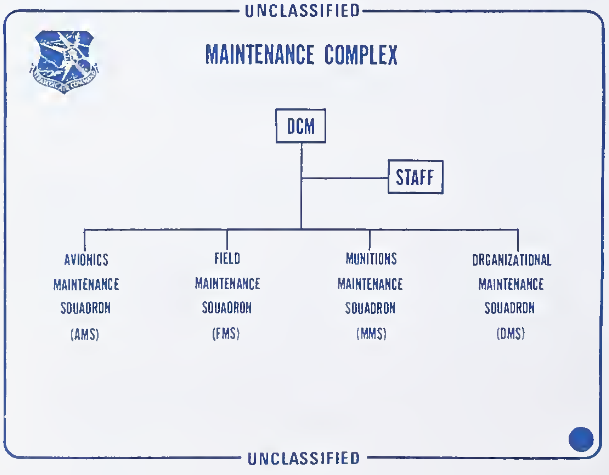

UNCLASSIFIED
MAINTENANCE COMPLEX
DCM
STAFF
AVIONICS MAINTENANCE SQUADRON (AMS)
FIELD MAINTENANCE SQUADRON (FMS)
MUNITIONS MAINTENANCE SQUADRON (MMS)
ORGANIZATIONAL MAINTENANCE SQUADRON (OMS)
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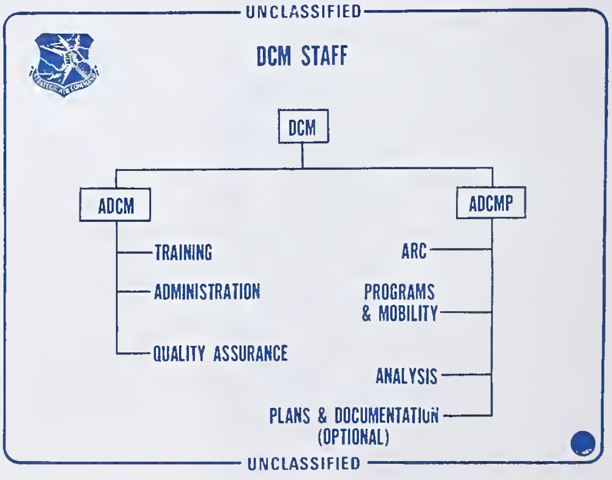
Figure 2.



tant DCM for Production (ADCMP) is responsible for Analysis, Programs and Mobility, the Aircraft Readiness Center (ARC), and Plans and Documentation. The ARC was formerly known as Job Control. The ARC monitors and coordinates aircraft maintenance — they no longer direct maintenance. That function has moved to the flight line. The Plans and Documentation function handles EWO contingency and maintenance plans, plus monitors aircraft hourly inspections.

Look at OMS **(Figure 3).** Plans and Documentation in OMS reports to Supervision. Alternate Mission Equipment (−21) and Tool Crib may report directly to Supervision or be divided into the bomber and tanker branches. OMS may have up to four branches. The Alert Branch provides maintenance support for immediate launch of aircraft in support of strategic missions. The Inspection Branch performs major aircraft inspections like phase or periodic. This branch is also shown as optional in FMS or OMS to give the DCM flexibility.

Now we come to the heart of the maintenance complex — the Bomber and Tanker Branches. These branches show the most change under ROLS. The B-52 Bomber Branch **(Figure 4)** is enlarged with the addition of aircraft schedulers, debriefers and on-equipment specialists from AMS and FMS. The key to this organization is the line chief — that senior noncommissioned officer who has the authority, responsibility and resources to get the job done. This individual now controls and directs maintenance on the flight line. If you have a question, you now call the "regular crew chief" — the line chief. You will note that some of the specialties shown under the specialist flight are starred. Across the command, our units differ radically in size. Due to this fact, the smaller shops may not have enough personnel to split three ways — to the bomber branch, tanker branch and shops. Therefore, the DCM has the option of assigning these specialties to the OMS branches or keeping them in the shops. The FB-111 Bomber Branch and Tanker Branch are organized the same way as the B-52 Bomber Branch.

The Tanker Branch — the Blue Knights — at Fairchild is now organized the same way as the B-52 Bomber Branch. The key to both branches is the line chief.

Figure 3.

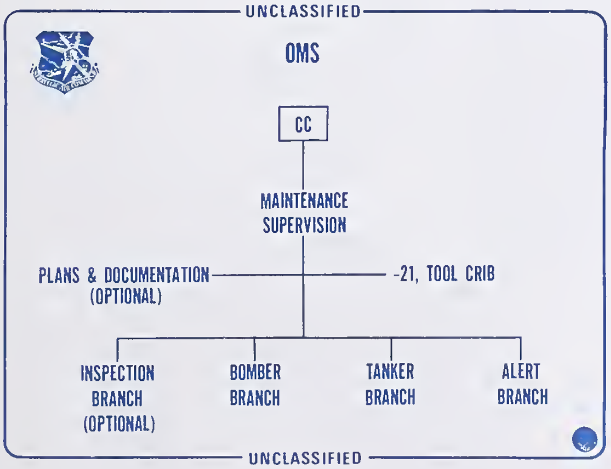
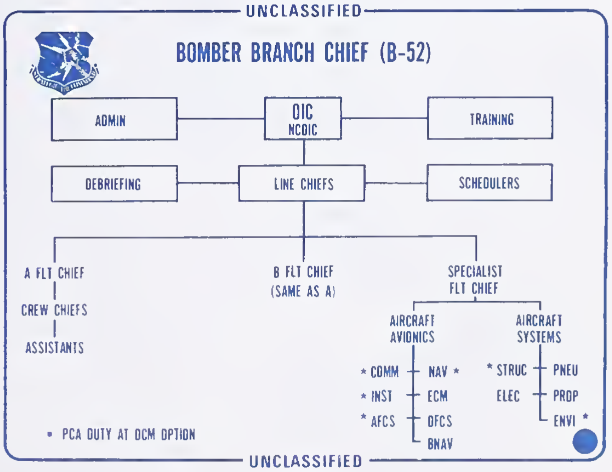


Figure 4.



AMS (**Figure 5**) will be smaller due to the movement of specialists to OMS. The number of branches in AMS may vary from three to five. The Communication/Navigation Branch and the Autopilot/Instrument Branch may remain the same if those specialists remain in AMS (DCM option). Units may combine these two branches, resulting in the Aircraft Systems Branch. The off-equipment portions of Bombing Navigation, Electronic Countermeasures and Defensive Fire Control plus Photo Shop constitute the Mission Systems Branch. However, if the unit desires, the off-equipment portions of Electronic Countermeasures, and Defensive Fire Control may be split off into the Defensive Systems Branch. These options provide the units with flexibility — to take into account size, manning and facilities.

Figure 5.

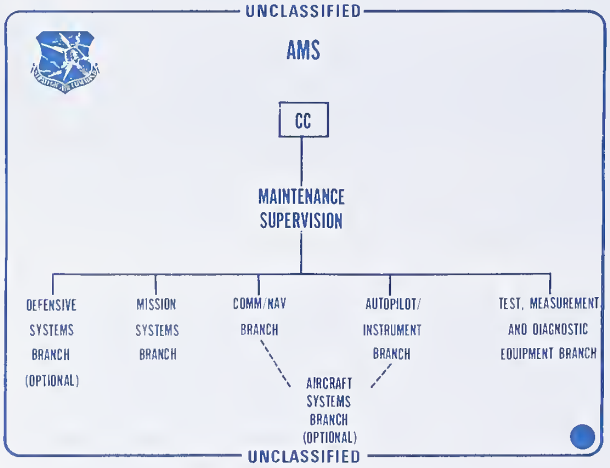
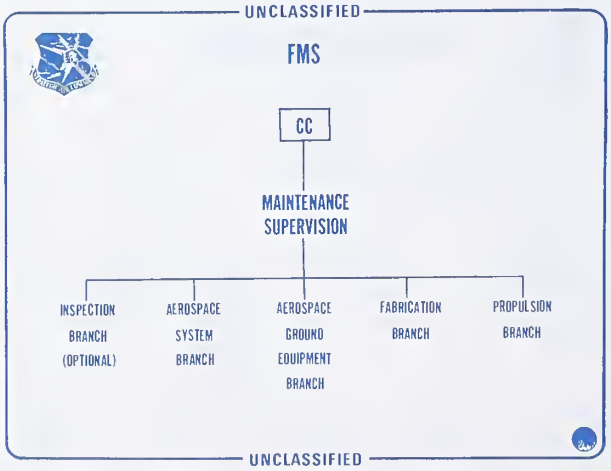

UNCLASSIFIED
AMS
CC
MAINTENANCE SUPERVISION
DEFENSIVE SYSTEMS BRANCH (OPTIONAL)
MISSION SYSTEMS BRANCH
COMM/NAV BRANCH
AUTOPILOT/ INSTRUMENT BRANCH
TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT BRANCH
AIRCRAFT SYSTEMS BRANCH (OPTIONAL)
UNCLASSIFIED

Figure 6.



Finally, FMS (**Figure 6**) has lost propulsion, electrics and hydraulics specialists to OMS, but it has gained non-powered Aerospace Ground Equipment (stands, tow bars) which is absorbed by the Aerospace Ground Equipment Branch. As discussed earlier, the Inspection Branch may be assigned to FMS if the unit desires. The other big movement concerning FMS is that the former Engine Management Branch assigned to the DCM staff moves to the Propulsion Branch as a section.

Obviously, ROLS is a tremendous organizational change for SAC aircraft maintenance. The current command thrust is to allow the units the organizational flexibility to meet their mission requirements — taking into account their manpower and facilities. There are a number of benefits to be gained by ROLS. We expect increased efficiency on the flight line with better teamwork and more resources on the flight line to do the job. Additionally, ROLS makes the most of our NCO talent. By moving the decision making authority to the lowest level, we will develop stronger NCOs. We also provide the resources to a highly knowledgable, experienced individual — the line chief. Finally, we'll have the ability to more easily handle sortie taskings because aircraft are fixed faster. The guidelines and regulation for ROLS are in the field. SACR 66-14 provides guidance to our ROLS organizations. ★★

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COMBAT CREW READINESS — SAC'S KEY TO SUCCESS

Maj Gen E. G. Shuler, Jr.
Deputy Chief of Staff, Operations
Strategic Air Command

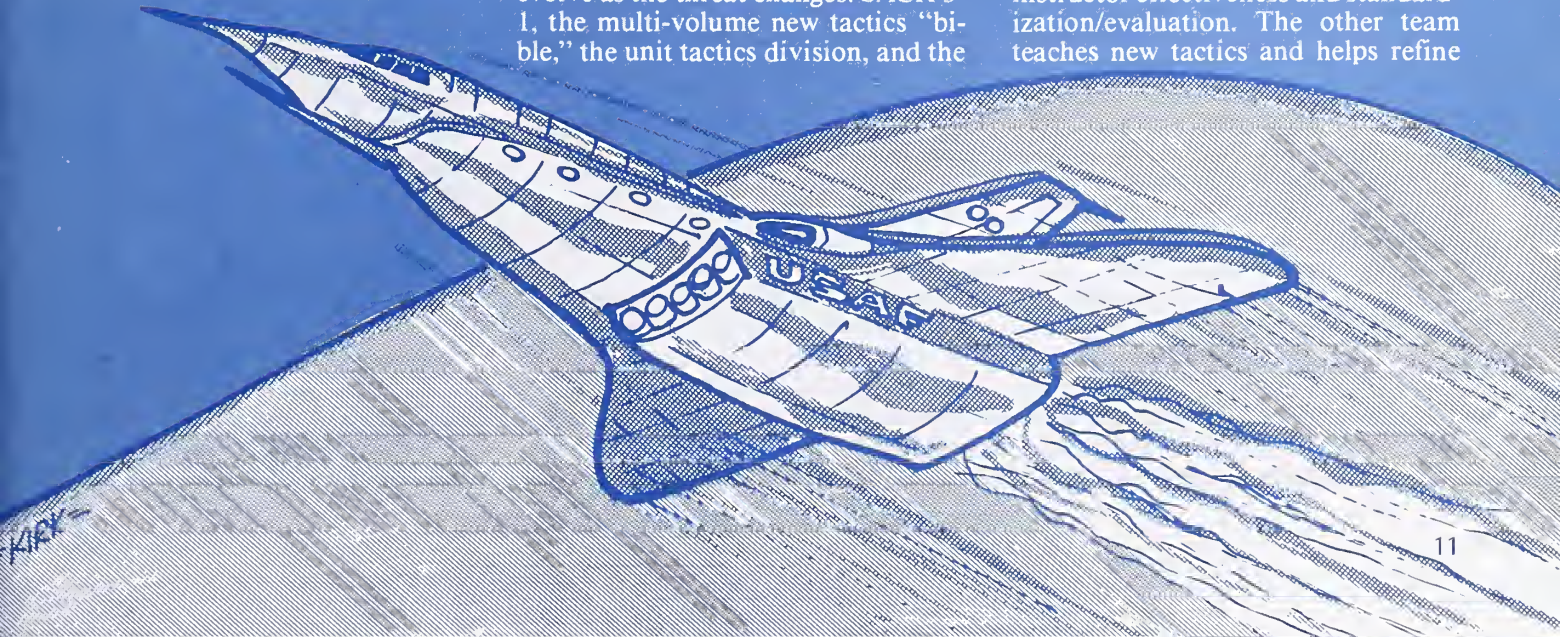
Since the early 1980's SAC has made significant improvements in our weapon system capabilities. New and enhanced systems — the B-1B, MX (PEACEKEEPER) missile, KC-10, KC-135R, B-52 Offensive Avionics System (OAS), and air-launched cruise missile (ALCM) emerged from upgrade and developmental programs and are being fielded. The modernization effort continues today with the development of a basing mode for the second 50 PEACEKEEPER missiles, the small ICBM, and the advanced technology bomber (ATB). To get ready for these challenges an equally impressive framework must be created to train, manage and lead you — the people that make our mission happen. You're the critical difference — that vital link to SAC's operational readiness.

Your **"Can Do"** spirit must be coupled with an innovative, responsive, and rewarding environment. The effect will be evolutionary, imaginative, and adaptive — similar to our new weapon systems — with a crew force that knows how to win in the combat arena. As you read this article, many readiness initiatives will have already been implemented — the unit level tactics division, transfer of aircrew scheduling responsibility to the squadron, and the missilier's Techniques Manual and Study Guide.

What can you expect to see in the aircrew world over the next five years? An exciting and challenging training program designed to stress realism. The Strategic Warfare Center (SWC), a vast flight training complex in the upper Midwest, becomes a reality. The SAC Tactics School, designed to serve as a repository for tactics "know how," is fully integrated into the SWC. A massive tactics rethinking effort allows you to train against realistic threats, utilizing updated tactics procedures developed through the combined efforts of your unit tacticians, combat intelligence specialist, and the SAC Tactics Standardization/Training Team. Expect your tactics and training to be adaptive and evolve as the threat changes. SACR 3-1, the multi-volume new tactics "bible," the unit tactics division, and the SAC tactics school are all designed to give you the edge that allows you to prevail.

A renewed emphasis on airmanship skills and proficiency is also underway. The goal — a framework that focuses on "Aircraft Commandership," fine tunes aircrew skills, and enhances readiness. You will see some redirection in the training program, adoption of predeployment familiarization training, and creation of a "post graduate" pilot course, among other initiatives. The renewed effort is designed to foster the pride and self-confidence inherent in each and every crewmember. In addition to the new airmanship initiatives, the SAC Bombing and Navigation Competition is being revised to stress realism.

The enhancement of CEVG is another step toward improving force readiness. CEVG is being divided into two separate teams — the Tactics Standardization/Training Team and the Evaluation Team. One team consists of trainers, the other a team of evaluators — each visiting a unit every 24 months, on an alternating basis. One team measures training, instructor effectiveness and standardization/evaluation. The other team teaches new tactics and helps refine



procedures in a "no threat" setting. They provide ground and inflight tactics training and establish a crossfeed for developing other new procedures and techniques. The goal — highly trained crews capable of succeeding in an actual combat environment.

In addition to improving individual aircrew capabilities, special readiness emphasis is being focused on the unit as a whole. ORIs are expanding to include conventional wartime tasking. Conventionally tasked units will undergo a joint EWO/conventional ORI designed to measure their capability to perform the full range of unit taskings. The LEADING SHIELD program, designed to prepare conventionally tasked units to deploy and operate from their actual wartime forward operating location (FOL) continues to expand. Unit staffs perform site surveys at the FOL, then design and implement unit tailored familiarity training programs. Circumstances permitting, the unit then deploys to the FOL to test their plan.

In the bomber world, the conventional warfighting commitment expands significantly. The challenge of a dual mission tasking — EWO and conventional — will soon be shared by all bomber units. However, that's only part of the change, the realm of bomber conventional operations also expands to include the delivery of modern precision munitions — something new to SAC. In turn, the new bomber commitment mandates improved defensive capabilities and new or upgraded aircraft equipment. As a result of these initiatives, aircrew training grows significantly to encompass the wider range of activities. In the near future "joint interoperability" becomes reality, as you routinely train and exercise with joint, allied, and Air Force counterparts.

Computer-spawned automated data processing (ADP) programs, now under development, will soon be providing real-time, on-line computer assistance throughout the unit. For example, mission planning, a time consuming process, can soon be completed with a standard micro computer program that generates all required paperwork. Crew scheduling — accomplished with the aid of a standardized computer system should significantly reduce current time consuming procedures. The Unit Mission Planning and Production System (UMPS) will be on board in the early 1990s — it allows unit planners to incorporate real time intelligence, threats, and targets into crew mission folders. The advent of the Automated Weather Distribution Systems (AWDS) means real-time weather forecasts that crews can depend on. All-in-all, computer run programs will significantly enhance crew capabilities while allowing more time to concentrate on getting the job done.

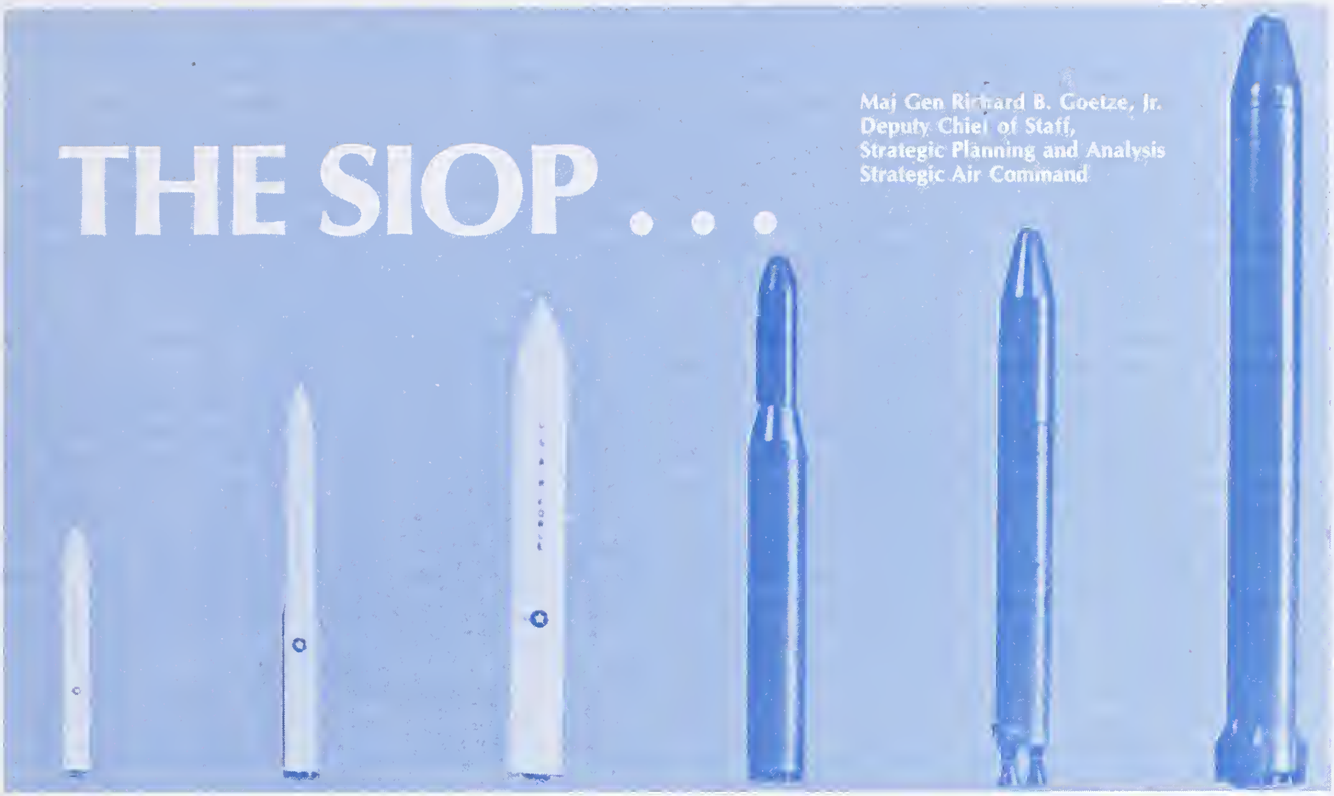
The missile leg of the triad is also undergoing strategic modernization. Fifty PEACEKEEPER missiles are being deployed at F.E. Warren AFB, improving the accuracy and yield of our force and providing the prompt, "hard target" capability that will enhance our deterrent posture. Crew functions for this new system remain conceptually the same as the Minuteman. Yet, there are some procedural changes associated with the Computer Aided Message Processing (CAMP) system that may eventually be incorporated into the Minuteman. In addition to the new systems, initiatives are under way to streamline operations in the Minuteman Launch Control Centers (LCC). The LCC integration program overcomes the operability, maintainability, and survivability deficiencies prevalent in the current LCC configuration. Other readiness enhancements are being developed to better "missilier vigilance." The new ICBM Techniques Manual and Study Guide places unit emphasis on missile crew knowledge, proficiency, professionalism, and judgement. Automated missile crew scheduling, training documentation, and self-paced student instruction are also under development — crews can then better utilize available time while devoting their efforts to learning the mission.

Efforts to modernize reconnaissance systems are leading to significant improvements in wartime survivability — procedural enhancements are being developed with changes to tactics and aircraft/support systems on the horizon. Streamlined processing systems provide the tactical field commander with near real-time intelligence products. Therefore, the demand for reconnaissance support will increase as we improve the capabilities and significant contributions to theater commanders by SAC reconnaissance forces.

Command and control of the SAC forces — a critical element of SAC's wartime readiness — is also undergoing a deserved modernization. HQ SAC is building a new Command Center — designed to incorporate the latest in technological advances. Contact with, and control of, the crew force will be more reliable and sustainable in any scenario. In local unit command posts, controllers in the new 19XX career field will take over the consoles. This career field replaces the rated staff with the nonrated controller specialist. The new careerists become a dedicated resource — intimately involved in the force management of all SAC assets.

You can see where SAC is heading and what we — the operators — are doing to improve combat readiness. However, these changes are only the beginning. You need to look around and contribute — tell us how to get the job done better. Improved capability — nuclear and conventional — is a must. Be a part of the "forward looking" Strategic Air Command — don't be satisfied with "the way we've always done it." Your challenge is here and now — as SAC heads into an exciting new era. **I look forward to being there with you!★★**

Maj Gen E. G. Shuler, Jr.
Deputy Chief of Staff, Operations
Strategic Air Command



THE SIOP . . . A PLAN FOR PEACE

Maj Gen Richard B. Goetze, Jr.
Deputy Chief of Staff,
Strategic Planning and Analysis
Strategic Air Command

After reading the title you may be saying to yourself "wait a minute, a plan for peace? The guy who wrote this article obviously has lost his sanity." But I suggest you think about it . . . sure the SIOP, the Single Integrated Operational Plan, is a war plan — a warfighting plan. However, it is only a warfighting plan if it has failed in its primary purpose . . . deterring war. This article is written to provide a glimpse of the "big picture" of what will shape the future SIOP. To accomplish this task, I will provide my perception of deterrence and its relationship to the SIOP, the Soviet threat, our strategic modernization aimed at countering that threat, and our future employment planning concepts.

Deterrence

As you well know, the SIOP is an annual plan that we've been producing for the past 25 years. It is indeed a plan for peace, a plan whose very existence strengthens deterrence and reduces the risk of war. It is also a plan that is constantly changing to reflect changes in national strategy, in Soviet threat, and in our own capabilities.

The primary security objective of our nation is to defend our right to live in freedom. Since World War II, we have achieved this objective by maintaining military forces capable of deterring aggression or intimidation. And while we believe that, in the words of the President, "a nuclear war cannot be won and must never be fought," we also know that effective deterrence requires that we must be prepared to fight — if necessary. Deterrence means military capability backed by political will — it means that an adversary is certain that the consequences of aggression will be totally unsatisfactory. In the past, the Soviets have been deterred because they knew that we could and would defend ourselves, that we could and would respond successfully to any Soviet challenge. During the past two decades, however, the Soviets have relentlessly modernized and expanded their strategic forces. In the past decade alone, Soviet expenditures for weapons were 50 percent higher than our own. And today, while we allocate about seven percent of our Gross National Product to defense, the Soviet military effort consumes an estimated 15 to 17 percent of their Gross National Product. Recent qualitative improvements in Soviet strategic forces, combined with large increases in numbers, have "unbalanced the military balance," and more importantly, may have changed Soviet perceptions regarding our capabilities.

The massive Soviet buildup has also hastened a reappraisal of our nuclear strategy. From the concept of deterrence based on assured destruction, a more realistic view of deterrence has evolved based on a credible retaliatory capability that threatens the Soviet leadership and key military assets. Assured destruction relied on the premise that the Soviets would not strike the United States, because we would retain the capability to destroy their urban industrial society in retaliation. But as it became apparent that the Soviets were not limited to an initial strike against our population centers, the option of retaliating against Soviet urban industrial targets became less credible — especially since it could invite a subsequent Soviet response against our cities. It was clear that more flexible employment options were needed; these options needed to redress the **real** Soviet Threat: their military forces and war fighting infrastructure. Ultimately this led to our present strategy which we call "flexible response with counterforce capabilities" which dictates a measured application of hard-hitting force against targets the enemy would least like to have destroyed. Thus, the Soviets cannot be certain of their ability to neutralize the United States or to limit damage to the Soviet Union, but they can be certain that in retaliation we would seek to disrupt Party control, interrupt critical leadership functions, and critically damage their most valued warfighting assets. However, from a SIOP planning standpoint, this means executing a strategy that requires precise timing and accuracy in the weapons employed, meaning greater weapon system capabilities.

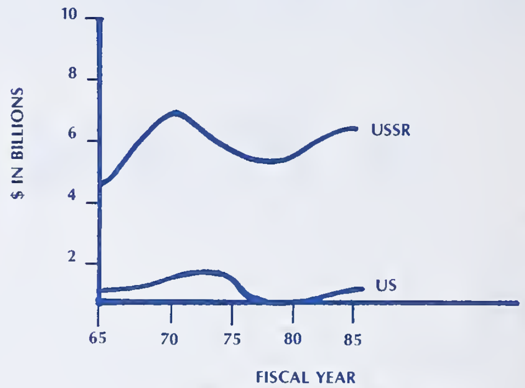
President Reagan has continued to further refine this "Countervailing Strategy" but at the same time introduced an additional factor that may profoundly influence future strategies: the Strategic Defense Initiative (SDI). As the President continues to advocate, SDI is part of a larger goal to reduce reliance on nuclear weapons and their role in international politics. In pursuing SDI, however, we must remain on guard against all potential methods for offensive use of nuclear weapons, and at the same time we must take a lesson from our ancient warriors who never went into battle with only a defensive shield, but also carried a deadly sword. We can therefore expect future guidance to continue with that countervailing strategy that deters the Soviets by directing SIOP application of our rapidly modernizing nuclear forces.

Threat

Soviet ambitions are indeed global. Lenin wrote: "We aim at the firm union and full fusion of the workers and peasants of all nations of the world into a single worldwide Soviet Republic." This goal remains unchanged. To expand their control and influence throughout the world and to attain this goal, the Soviet Union has long relied on military power as its primary instrument. Over the past few years the U.S. has made considerable strides toward restoring our military strength. Yet the threats to our vital interests have also grown and continue to pose challenges both to our capabilities and to our resolve. The Soviet Union continues to modernize their offensive and defensive forces with the development and deployment of new generations of more capable land, sea, and air forces. For about 15 years the Soviets have evolved silo and command control systems which are hardened to significant levels of blast overpressure. With the initial deployment of mobile SS-25 intercontinental ballistic missiles to operational ICBM regiments in 1985, the Soviet Union provided further proof of its intensive drive for offensive military weapons capable of underwriting its expansionist objectives. In simple terms, they are pursuing greater mobility and protection of their critical war fighting assets.

The Soviets are continuing to diversify their offensive strategic capabilities. The new Bear-H bomber armed with modern, long-range, air launched cruise missiles is only one example. The ground-mobile SS-25 is now being deployed and the multiple warhead SS-X-24 will soon be deployed in both a silo-based and a rail-based version. In conjunction with this offensive buildup, the Soviets continue to increase their passive and active defenses. Their expenditures for strategic defenses are far greater than ours. (See Figure 1)

FIGURE 1
(Figure reproduced from Annual Report to Congress FY87)



Comparison of US/USSR Strategic Defense Expenditures

The passive measures include the hardening of ICBM silos and launch facilities to an unprecedented degree (far above the strength of our MINUTEMAN silos), and the proliferation of hardened leadership and command, control, and communications bunkers. Soviet advances in the active strategic defense are also substantial and increasing. These forces include air, missile antisatellite defenses. Additional advances include construction of an interlocking network of new large phased-array radars to provide the Soviets with an ABM defense capability. The overall effect of improving defenses is to create a military structure designed to fight and win a nuclear war. To combat this war-winning strategy, our SIOP plans and forces must strive for capability to defeat these defensive measures by improving accuracy against Soviet hardened facilities and providing the flexibility to counter Soviet mobility.

Weapon System Modernization

During the past several years the US has begun to reverse the negative trend in the strategic balance. Our strategic modernization program is designed to meet the challenges of the evolving Soviet threat and maintain strategic stability. The full weight of the President's strategic modernization program will be felt late in the 1980s and early 1990s as the Peacekeeper, Small ICBM, B-1B, Advanced Technology Bomber (ATB), Advanced Cruise Missile (ACM), SRAM II and the Navy's D-5 missile enter the force. The ICBM force improvements are needed to put time-urgent, hardened targets at risk, an essential element of our strategic deterrence. The Peacekeeper will provide a large percentage of the needed very hard target kill warheads in the 1990s. Peacekeeper has performed exceptionally well in its test flights. Initially, we plan to deploy only 50 Peacekeepers into existing Minuteman silos at F.E. Warren Air Force Base in Wyoming. In addition, we have investigated alternative basing modes for the second 50 missiles. After the initiation of a Soviet attack, the Peacekeeper with up to 10 MIRVd warheads can be used to strike time urgent hardened targets in the fashion required to blunt this Soviet first strike. To complement the Peacekeeper's deterrent capabilities, we are continuing research on the Small ICBM. This new weapon system, to be fielded in the early 1990s, promises to complicate Soviet attack planning and enhance survivability in an era of increasingly accurate Soviet missile forces. Enhanced survivability will allow for an ICBM weapon system to strike time urgent targets across the entire spectrum of conflict. The structure of our ICBM force can be seen in the following chart. (See Figure 2)

Our bomber modernization programs are designed to use our technological advantage to render Soviet defenses ineffective. The B-52 force is slowly losing its penetration capability against active Soviet defenses. We have modified 98 B-52Gs to carry cruise missiles and are currently modifying our B-52Hs to carry ALCM. The B-1B will eventually become our primary penetrating bomber. But the Soviet air defenses will continue to improve through the 1990s which will require an even more sophisticated penetrating bomber. The ATB will use low-observable techniques to negate present and projected Soviet air defenses. Our bomber force will also be enhanced with the ACM and the improved SRAM II. The ACM will have a greater range than current cruise missiles and will incorporate low-observable technology. This will allow our B-52s to stand-off even farther from Soviet defenses and still put distant Soviet targets at risk. This bomber force provides the US with a great degree of flexibility to accomplish a variety of missions. The structure for our bomber force can be seen in the following charts (See Figure 3).

Employment Planning

Our nation's war plan addresses the need to provide the National Command Authorities (NCA) with a means of controlling escalation should deterrence fail. If we cannot control escalation, we are charged with leveraging our force capabilities the best we can with our employment plans so that we can defeat enemy objectives and terminate the conflict on terms favorable to the U.S. To accomplish this, we use a building block approach in developing the SIOP. Such an approach provides the NCA with flexible options that can either utilize a small number or a large number of weapons to meet a specific goal. We strive to provide the NCA with real-time flexible response options.

FIGURE 2

(Figures reproduced from Annual Report to Congress FY87)

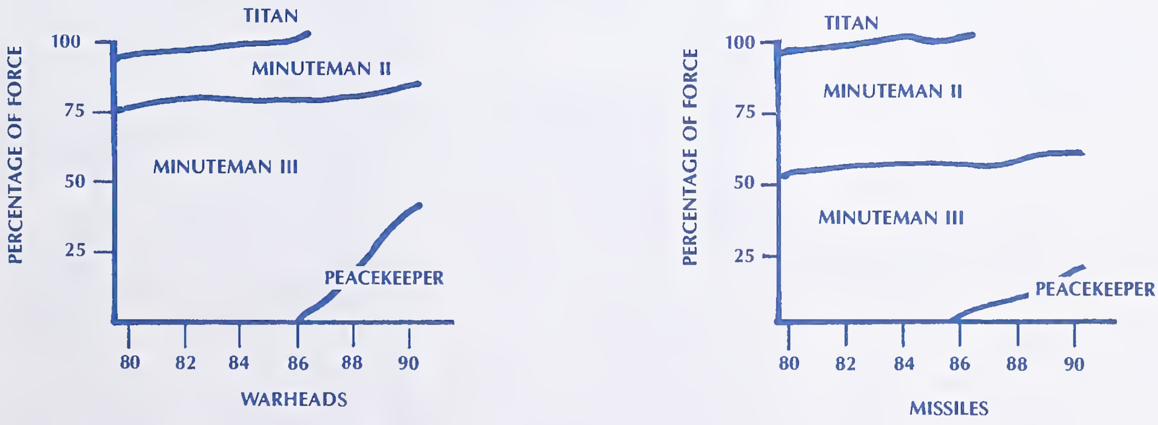
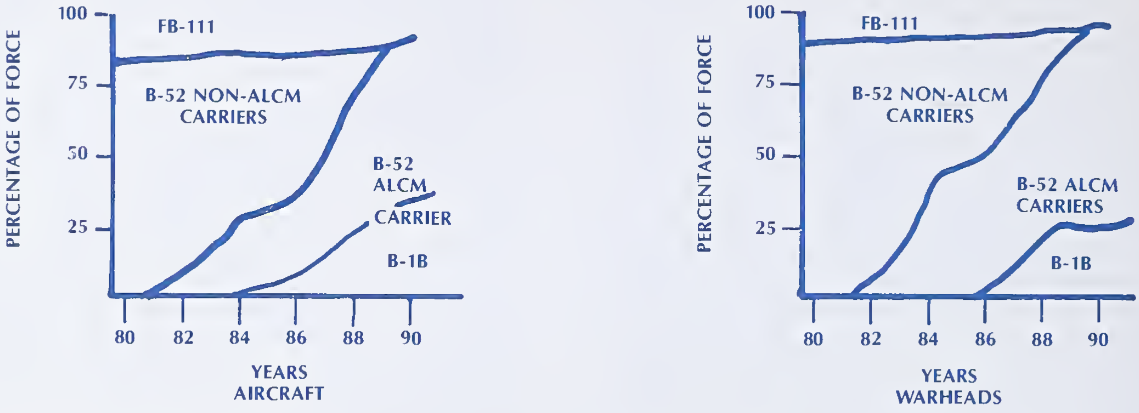


FIGURE 3
(Figures reproduced from Annual Report to Congress FY87)



To further refine these capabilities, we are pursuing adaptive planning capabilities — capabilities which will allow future planning systems to respond on a real-time basis to changes in policy, threat, and forces. Numerous initiatives are underway to reduce the time required to build the SIOP or modify it during a crisis. Innovative planning systems and procedures that will maximize force effectiveness are currently being brought on-board. As we enter the 1990s, the time required to build the SIOP can be expected to be reduced from months to weeks or even days. The time required to retarget sorties in a conflict will be reduced from a few days to a few hours, and in some cases, to a few minutes. This will have a substantial impact on our operational units. Unit planners must be prepared to perform sortie maintenance or respond to retargeting orders on a daily basis. Aircrews, for example, may be required to react to changes in targeting information or intelligence updates about changes in enemy defenses while enroute to the target area. This is particularly important given the dynamic nature of the evolving threat, e.g., the SS-25. The bottom line is that we can expect today's rigid preplanned SIOP, requiring months to build and change, to be a thing of the past.

Conclusion

Our war plan, the SIOP, in combination with our strategic forces and the people who man them provide nuclear deterrence. As our perceptions of what deters have changed, the guidance directing the construction of the SIOP has been modified. The ever increasing Soviet threat has required the US to spend a great deal of money on modernizing strategic forces. As our new weapon systems enter the inventory, our war plans must be able to employ these new systems in an effective and efficient manner. The desire for flexible employment options to control escalation will cause the building of the SIOP to become more adaptive and time responsive. The challenges are still in front of us to accomplish these tasks. We understand that these evolving trends will create a far more complex SIOP . . . one that will challenge our planners and crews to build and execute effectively. We in the Strategic Planning and Analysis DCS realize the problem is not a simple one, but with your help in the future, we will continue to provide our nation a war plan that indeed deters any potential aggressor. ★★

Maj Gen Richard B. Goetze, Jr.
Deputy Chief of Staff,
Strategic Planning and Analysis
Strategic Air Command

PERSONNEL

Col Lawrence F. McNeil
Deputy Chief of Staff, Personnel
Strategic Air Command

SAC's future will provide many outstanding opportunities for those crew members seeking a challenge. Enhancing the combat capability of SAC will require a delicate balance between our two pillars of strength: hardware and people. Our job in the personnel community is to support the "people" pillar, and we intend to keep the "person" in personnel. Programs like the new Defense Reorganization Act may result in significant changes to the way we look at our future assignment opportunities. As a result individual goal setting and career planning will be even more important than they have been in the past. Our future leaders will advance quickly through the wickets from apprentice to journeyman to master air leader, and as today, will require specialization and expertise in their weapon systems along with continuing self-development through PME and formal education.

As SAC steers towards the twenty-first century, we intend to keep personnel programs responsive to the crew force. The assignment process is becoming more personalized as squadron commanders play a more active role in matching individual desires with SAC and Air Force needs. Rewarding proven potential within the ranks through programs such as "Spotlight" and grooming our leaders of tomorrow will enhance individual career development and contribute to the strength of the command. Providing opportunities for some of our aviators to serve in staff positions at the wing and headquarters levels while others continue to provide leadership to the crew force can only strengthen our capabilities.

The results of command initiatives coupled with enlightened senior leadership are reflected in favorable retention rates. Even in light of aggressive airline hiring and a healthy economy, our overall retention rates continue to meet or exceed our requirements. As SAC's commander in chief stressed, "We're trying to create an environment where people enjoy coming to work . . . and if it's 'fun' they stay with us."

SAC aviators stand at the threshold of a new era. Force structure changes and new weapon systems such as the B-1, KC-10, the Advanced Technology Bomber (ATB), and the KC-135R program spearhead SAC's dramatic modernization. In addition, the Defense Reorganization Act may change the way we look at our careers. Although it's too early to estimate the full impact of the initiative, we know it will stress the importance of Joint assignments and lead to increased cooperation between the services. Crew members should keep an "ear to the ground" in order to be ready to respond to new challenges in the joint assignments arena.

The missile community is also facing considerable change. In the next five years as advanced and diverse weapon systems come on line, career opportunities for all missile personnel will grow more than any other time in the career field's history. SAC's newest ICBM weapon system, PEACEKEEPER, is being deployed at F.E. Warren AFB, creating additional 18XX and 31XX personnel requirements. The Small ICBM (SICBM) is currently under design and the proposed deployment could require as many as 15,000 personnel. The Ground Launched Cruise Missile (GLCM) is having a tremendous impact on missile operations, maintenance and support communities. GLCM will provide many new, challenging jobs, as well as expanded geographical assignment possibilities at six European bases. Further, an emerging new career field, Operations Management (19XX), creates many new opportunities for our crew members to gain experience in several diversified areas.

We in SAC personnel see our charter as helping our good people to make themselves even better. To do so we must motivate them to stay with us. Programs designed to groom, grow and challenge our combat crew members will pay Strategic Air Command dividends for many years to come. President Reagan, commenting on SAC's mission in today's and tomorrow's strategic arena, has emphasized that ". . . deterrence is our most important mission." Imaginative management and forward looking leadership will keep SAC's deterrent forces strong, the key ingredient in our national military readiness. You, the SAC crew members are the "muscle" behind that deterrent might; and we, in personnel, vow to provide the support that will ensure you a rewarding and satisfying career.

Col Lawrence F. McNeil
Deputy Chief of Staff, Personnel
Strategic Air Command

Project Warrior

From Air Force Magazine, May 1984. Reprinted by permission of Litton Applied Technology.

Maj Ken Teepell
HQ SAC/DOJ

SAC's Tactics Programs

Have you ever finished a mission and thought, "I know there is a better way to handle that threat, and I think I know how to do it." But, frustrated, you let the idea ride because you figured there was no way to get the message out to the rest of the force or into SACR 3-1, Mission Employment Tactics? Well, there is a way. This article discusses the process you can use to get good, solid ideas into SACR 3-1 and out to the command. It can be done and it might not be as hard to do as you think. How will the tactics found in SACR 3-1 be developed? How does a steely-eyed aviator make an input, submit an idea for consideration and evaluation or highlight, a tactics deficiency? The answer is found in the new SACR 55-133 which establishes policies, responsibilities, and procedures for conducting the SAC Tactics Development Program.

The goals of this program are to:

a. Identify tactics deficiencies in all areas of strategic operations.

b. Conduct a formal Tactics Development and Evaluation (TD&E) program to develop new tactics and correct tactical deficiencies.

c. Validate existing tactics.

d. Consolidate and rapidly disseminate tactical information in a format which meets user requirements.

e. Establish the SAC Tactics Board (STB) to provide the full range of functional expertise necessary to address tactics issues.

f. Establish a five year TD&E plan for test priorities, funding and resource allocation.

g. Determine tactics requirements, develop tactics, evaluate tactics and incorporate the findings into SACR 3-1.

At HQ SAC, the Tactics Division (DOJT) is the manager for the tactics development program. HQ SAC/DOJ is the sole tasking and approval authority for tactics within this command. Tactics development projects are assigned by a test request to the appropriate SAC agency for conduct of a desired tactics TD&E test. A Tactics Director is assigned and responsible for developing the project plan, as well as conducting and reporting TD&E. Tactical units tasked to support a TD&E will assign a project officer, from the unit Tactics Division (DOJ), who will support the test as required by the director's project plan.

The unit Tactics Division (DOJ) was developed to train crews and staff personnel to recognize the threats and how to counter them to insure mission success. Your unit DOJ will assist you in notifying HQ SAC/DOJT of your suggestions concerning tactics. We are depending on your knowledge and experience for the submission of ideas whenever current tactics are questioned or new tactics are recommended. These tactics are for you and your support is needed to insure their continued validity. Any new tactics will be published in the SACR 3-1 volumes.

Now that the players are established, let's trace the flow of a tactics idea from initial concept through certification. Suppose that a crew, when flying Red Flag, comes up with a novel approach to a tactical problem, determines that a tactics deficiency exists, or challenges validity of a specific tactic. How does a crew member communicate this information to the rest of SAC? The process begins with a Tactics Improvement Proposal (TIP). The format and forwarding procedures for this report are found in SACR 55-133, Atch 8. Each unit and numbered air force (NAF) conducts an annual Tactics Review Board (TRB) to evaluate tactics available for mission accomplishment and review all TIPS submitted. The final review is a STB conducted at HQ SAC. This board reviews **all** tips and established a TD&E priority list. The board will then recommend action on TIPS, assign an OPR, priority action to be taken and time lines. The board will submit a test request which outlines specific objectives and guidelines to appropriate SAC agencies.

Individual participation in the tactics development process does not necessarily stop after submission of the TIP. Operational units will often be requested to provide support for TD&E projects. After the flying phase of the TD&E is completed, a final report is approved and distributed to all SAC units. When test results merit immediate attention, an interim report message approved by HQ SAC/DOJ will be transmitted to all SAC flying units. A "Quick Look Report" may also be distributed whenever information becomes available which has immediate impact. HQ SAC will use AIG 668 and 758 to pass tactics information. If your unit or agency is not on one of these AIGs and you wish to receive QLRs, submit your request to HQ SAC/DOJ.

SACR 55-133, Atch 1, illustrates the tactics development process and the associated information flow. Validated tactics resulting from TD&E projects are one of the primary sources of information for SACR 3-1. Therefore, the ideas or deficiencies highlighted by TIPS, when validated, can become the foundation for the appropriate volume of SACR 3-1.

Another avenue for publication of tactics information is the Tactics After-Action Report found in SACR 55-133, Atch 7. This is a report developed following participation in exercises (e.g., Red Flag), overseas deployments which involve tactical operations and completion of wing TD&E program when information becomes available. HQ SAC/DOJT will evaluate these reports and issue a QLR if warranted.

Hopefully, this introduction to the tactics development process will encourage your participation. SACR 55-133 should be read in its entirety to fully understand how an aviator can participate in the SAC tactics process. The regulation is a required document in all SAC flying wings and should be easily accessible. We all have a responsibility to disseminate tactics ideas and information to improve our capability to accomplish the mission. In this effort, we are eagerly looking forward to evaluating your TIPs.

In the future, the focal point of the tactics program will be the Strategic Warfare Center (SWC) which is currently being developed by HQ SAC Strategic Warfare Center Division (DOJX).

The Strategic Warfare Center will be the focal point for tactics development and crew training. The center will provide realistic training through a formidable array of threat simulators and a comprehensive range integration instrumentation system. Coupled with a tactics analysis team dedicated to exploit Soviet and communist bloc tactical intelligence data, the center will challenge our combat aircrews to hone their flying skills in a dynamic, learning environment.

The SAC tactics process and Strategic Warfare Center is a direct reflection of the forward thinking philosophy of the command and our back to the basics approach to training. It will allow us to take advantage of the latest intelligence and constantly upgrade, validate, and test our tactics and aircrew procedures. The SWC will improve our ability to meet the threat-improving readiness; equating to deterrence.

About the author. Maj Teepell currently is deputy division chief of the HQ SAC Strategic Warfare Center Division. Until August 1986, he was branch chief of policies and issues in the HQ SAC Tactics Division.

The Low Vis Landing — Stack the Odds in Your Favor (Part II)

Maj R. D. Williams
SIFC, Castle AFB

Last month's article began a discussion on low visibility landing parameters. A review of that issue should be made before we go on to crew coordination.

If you only fly a single seat aircraft, you might want to skip to the next section (Single Seat Aircraft).

Although I haven't checked the record book, I believe "a breakdown in crew coordination" has been cited as a contributing factor in approach/landing accidents more than any other single factor. In the aforementioned NTSB special study, 16 of the 17 mishaps listed "a breakdown in crew coordination procedures" as a primary or contributory causal factor. To prevent yourself (and crew) from falling victim to this killer, you must be prepared. Being prepared means developing crew procedures on who will fly the approach, who will land the aircraft, and what is expected of each crew member. Emphasis must be placed on cockpit communication procedures and establishing who will be responsible for monitoring the instruments to touchdown.

Who flies? Who Lands?

For those of us who fly two-seat aircraft, there are two widely accepted techniques that deserve some discussion. The pilot flies the approach and landing, or the copilot flies the approach and the pilot makes the landing. SIFC teaches both methods and believes the decision on which method to use must be left up to the aircraft commander. The aircraft commander must know the pros and cons of both techniques.

Pilot flies. Pilot lands.

Advantages include:

- As pilot in command the pilot has ultimate responsibility for all decisions. Accordingly, the aircraft is in his control throughout the approach.
- The pilot is more experienced, and in most cases, flies the aircraft better than the copilot. The importance of a stabilized approach is well known to all of us.
- A transfer of aircraft control is not required close to terra firma.

Disadvantages include:

- Limited time is available for the pilot to be "heads up" outside the cockpit to search for the "illusive" runway environment. 80-90 percent of his time will be "heads down" in the cockpit.
- A tendency to "go visual" without sufficient visual information.
- If a missed approach must be initiated, especially below DH, the pilot will most likely have to transition back to the gauges. This can take several seconds to accomplish if the pilot has completely abandoned the instrument crosscheck.

Copilot flies. Pilot lands.

Advantages include:

- The pilot can be 80-90 percent "heads up." This provides him with "real time" information on which to base his continue/go around decision throughout the most critical portion of the approach. The copilot continues to fly instruments until the pilot takes the aircraft. If the pilot does not take the aircraft until adequate visual references are available, the "duck under" is highly unlikely.
- If a go-around decision is made, the copilot is already on instruments and executes the maneuver, eliminating the need for the pilot to transition back to the gauges.
- The copilot maintains "heads down" throughout the entire approach. Once the pilot takes the air-

LOW VIS LANDING . . .

craft, the copilot remains "heads down" to detect any deviation from a normal glidepath. The need to transfer this responsibility in the vicinity of the DH/MDA is eliminated.

Disadvantages include:

- The copilot must be able to fly the ILS approach with very tight tolerances. Deviations at or below DH in excess of one-half dot on the glidepath and/or one-fourth dot on the localizer would most likely necessitate an immediate go-around.
- A transfer of aircraft control near the ground is required. This requires the aircraft to be stabilized (trimmed correctly).
- If this technique is used exclusively in low visibility situations, the pilot can rapidly become a "fair weather" pilot. To maintain some degree of proficiency, the pilot needs to fly some approaches to a final landing in marginal weather.

Monitor the gauges.

Monitor the gauges.

This point cannot be overemphasized. Someone must monitor the instruments throughout the whole approach. If both pilots (or other crew member) go visual, deviations from the proper glide path will go undetected until too late. What about the crew member in the jump seat if applicable? A boom operator can monitor the glide slope and advise the pilot of any deviations. Pilots do not purposely land in the approach lights!

If the pilot flies the approach and landing, once the pilot goes visual, the copilot must monitor the flight instruments to touchdown (most SAC Dash I's require the pilot not flying to call out deviations to sink rate and airspeed until touchdown). If the copilot flies the approach, he will stay on instruments throughout the approach.

Callouts!

What do you want to hear from your crew members? Only what is pertinent to the approach and landing. "I see the ground" is nothing but a distraction and has no place in a low visibility approach. Besides required Dash I callouts, SIFC believes interphone conversation should be limited to the use of the words "cue," "visual," "go-around," "I have the aircraft," "sink rate," and other callouts pertaining to visual cues associated with the runway environment.

"Cue" means a sighting of the runway, approach lights, or other markings associated with the approach end of the runway: it in no way means "go visual." "Visual" means adequate references are available to maintain a visual glide path and the runway threshold and part of the touchdown zone is in view. Other callouts might include statements such as "slightly left, correcting," etc. The meaning of "go-around," "I have the aircraft" and "sink rate" should be self-explanatory.

Successful completion of an IAP requires teamwork. This means that all crew members with the capability to monitor the approach/landing must be involved in the total decision process. If a significant deviation is noted, an immediate missed approach should be initiated by the pilot flying the aircraft. The aircraft commander must insure his crew is aware of their responsibility to "speak up" if a deviation is noted. If the copilot says "go-around," go-around and ask questions later. More than one accident could have been prevented if another crew member had brought a deviation to the attention of the pilot or been a little more assertive.

Single Seat Aircraft

Although it's fun to fly solo, a "no kidding" instrument approach in marginal weather can literally make or break your whole day. You don't have the benefits of an extra set or two of eyes to break up the responsibilities of cross checking the gauges and monitoring the runway environment. It's a "one man show," you have to divide your time between "heads up" and "heads down" for composite flight.

Dividing your attention between external cues and the flight instruments requires the utmost in concentration. Avoid the temptation to "go visual" too early. You must monitor the gauges throughout the whole approach. This point cannot be overemphasized! It is imperative that composite flight be utilized until such time that the touchdown zone is in view. If the instruments are dropped out of the crosscheck with only marginal visual cues, deviations to the glide path and excessive sink rate will, in all probability, go undetected until it's too late.

Let's Tie it All Together

Continuing an approach below MDA/DH is not a commitment to land. The decision to continue or go-around must be evaluated all the way to touchdown. If cues are lost below MDA/DH and/or the approach becomes destabilized, your next course of action is clear-cut — go-around! But what about the case when you are flying a perfect approach and the runway environment remains in view? At some point you must decide if references are sufficient to transition to visual flight or if a go-around would be the best course of action.

For nonprecision approaches, the answer is pretty objective; any descent below the MDA without adequate references to maintain a visual glide path is at best risky and not recommended. The SIFC "best bet" is to stay at the MDA until the touchdown zone is in sight; otherwise you have no means available to judge the proper descent angle. Depending on the type of aircraft, if the touchdown zone is not visible by the VDP, a missed approach might be the proper course of action.

In the case of the precision approach, the answer is not that simple. Unfortunately, it is difficult, if not impossible, to be completely objective in trying to establish a single rational answer on if, when, and how far one should/may continue an instrument approach below DH. What I have tried to do is provide you with some important facts, figures, and SIFC thoughts on the subject. The objective was to better prepare you to make the right decision the next time you are faced with less than ideal weather conditions while flying an ILS or PAR.

With the possible exception of some critical action procedures, low visibility approaches and landings demand the utmost in pilot skill. It is hoped that the above information might be of some help for the winter season. *Call SIFC at Autovon 347-4571 if you have questions.*

Boom Effects

TSgt Richard Radvanyi
CFIC Castle AFB

For those of you who have attended CFIC, read on, this may be a good refresher and provide an excellent topic for your next "tanker-bomber" hangar flying session. For those of you who have not had the opportunity to attend CFIC, this is a preview of some of the things that you will see and do when you get there. The topic is boom effects and it concerns receiver pilots, tanker pilots and boom operators.

Now everyone knows what a primary flight control surface is, right? Ailerons, spoilers, elevators, rudder etc., but did you know that the KC-135 comes equipped with a secondary flight control known as "the boom?" If you think about it, the boom is really just another rudder, and in some ways it can even act as a throttle control! Don't believe me, huh? Well I'll explain a couple of the air refueling demo's that we do at CFIC and hopefully show you how these "boom effects" can affect your performance during air refueling operations.

Earlier, I said the boom is just another rudder. To prove this, we do a simple maneuver called a boom turn, in which we turn the tanker with the boom. The boom is lowered to 30 degrees elevation and then flown to 8 degrees left or right (depending on which way you want to turn). The tanker pilot simply maintains a neutral yoke. With the boom positioned at an azimuth limit, the tanker will roll into a turn without any problem. Then to roll out, you just fly the boom to the opposite direction. So what's this got to do with air refueling? Not much if the tanker has its autopilot on, because the autopilot compensates for the boom's effect. However, if the tanker has its autopilot off, there can be some complications. If the receiver comes in off centerline and the boom operator keeps the boom at 0 degrees azimuth until the receiver closes to the contact position and then swings the boom over to make contact, the tanker pilot had better be ready to counteract the rolling motion induced by the boom. Don't forget that the receiver is going to be reacting to the tanker's movements while the boom operator is trying to make contact.

What about night refueling? The Dash 3, the A/R manual for KC-135 operations, tells boom operators to "maintain the boom in a position that will prevent the boom nozzle light from distracting or blinding the receiver pilot." By swinging the boom to one side to keep the nozzle light away from the receiver pilot, the boom could destabilize the tanker's platform, which in turn causes the receiver to destabilize prior to getting a contact. So what's the answer? First, for receiver pilots, try to come in on centerline as much as possible. Second, for boom operators, if the receiver does come in off centerline, tell your pilot, so that they will be ready to correct any changes caused by the boom. If you're flying at night, ask the receiver where he wants the nozzle light. If he has no preference, try to keep it on centerline. Most heavy drivers really won't be distracted if you keep it right up the middle.

Now let's talk limit demonstrations. The boom is going to have the same effect whether there is a receiver hooked up or not. Receiver pilots can destabilize the tanker's platform by moving out to an azimuth limit too quickly. Keep your rate of movement slow and steady when going to the azimuth limits and keep it slow and steady when coming back to center.

Everybody knows that unannounced power changes during A/R cause problems, right? Did you realize that the receiver's position in elevation can cause the same effect as a small power change while in contact? One of the demonstrations we do to show this called a "receiver no-power limits" demo. Both tanker and receiver are autopilot on, in contact with the receiver stabilized at 0 degrees azimuth, 12 feet extension and 30 degrees elevation. The receiver then moves up to 22 degrees eleva-

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PROFESSIONAL PERFORMERS

Flying Crew

Recently, Capt Timothy C. Jones, P, and Capt Robert K. Umstaedter, RN, 509 BMW, Pease AFB, were flying the low level portion of a Maple Flag sortie in the Cold Lake Range when, at 400 feet AGL and at Mach 1.1, their aircraft developed a wheel well hot condition and spasmodic, uncommanded roll/yaw maneuvers. As Capt Jones began a climb he retarded the throttles to military, accomplished the bold face for the wheel well hot condition and swept the wings forward to 26 degrees. The severe roll/yaw gyrations continued as the crew entered a 2000 foot cloud deck at 1000 feet AGL. At this time Capt Umstaedter placed his hand on the ejection handle and discussed the possibility of ejecting but reconsidered as they exited the cloud deck. During the climb the wheel well hot light went out and the crew continued their efforts to regain control of the aircraft. Capt Jones turned off the flight control dampers with no result. Due to the severity of the roll/yaw maneuvers the crew was unable to refer to tech data. Capt Umstaedter suggested that the flight control disconnect switch was their last recourse. As Capt Jones placed the switch to override the aircraft was climbing through 8000 feet and had slowed to 320 knots. The aircraft entered one more violent roll-yaw prompting Capt Umstaedter to question whether Capt Jones had the aircraft under control or if they should prepare to eject. Capt Jones regained control and leveled off at 9000 feet. The crew declared an emergency and notified ATC of their condition and intentions. The landing gear was lowered and the remainder of the wheel well hot checklist completed. Due to the possibility of damage to the landing gear from the wheel well hot condition the crew elected to fly a visual approach to Runway 21 at Cold Lake to engage the Bak 12 approach end barrier. Capt Jones flew a flawless approach to a successful cable engagement. Capt Jones' quick reactions and flawless airmanship, along with Capt Umstaedter's indepth knowledge of emergency procedures prevented the loss of a valuable Air Force aircraft and crew.

Aircraft Maintenance

SSgt Jeffrey C. Hanson, 42 BMW, Loring AFB, is SAC's Maintenance Airman of the Month.

In his role as the supervisor in charge of both B-52G and KC-135A Engine Phase Inspection Teams, SSgt Hanson was presented the coveted SAC Master Technician Award in recognition of his continuous errorless performance. He has 23 consecutive months of error free performance in over-the-shoulder tasks and supervisory evaluations. During a recent MSET visit, SSgt Hanson passed three over-the-shoulder supervisory evaluations and an over-the-shoulder training task, all without error. Appointed supervisor in charge of both the B-52G and KC-135A Engine Phase Inspection Team in order to bring them back up to standards after a series of adverse setbacks, SSgt Hanson quickly brought his team up to par. The first B-52G and KC-135A evaluated after he took over as the supervisor received "outstanding" ratings. The B-52G evaluated in the new bimonthly period received an "excellent" rating. These accomplishments plainly highlight SSgt Hanson's outstanding technical skills and leadership qualities.

SSgt Jeffrey C. Hanson

Missile Maintenance

TSgt James F. Raymond, 394 ICBM Test Maintenance Squadron, Vandenberg AFB, is the SAC ICBM Maintenance Airman of the Month. As assistant NCOIC of the Mechanical Shop, he spearheaded a special rigging check on a damaged transporter-erector which prevented this valuable asset from being sent to depot for repair. Sgt Raymond helped redesign the work cage proof load test sling. This resulted in the development of a test sling with superior strength and versatility, which is much safer and faster to use. His superior systems knowledge helped develop a method for performing a weight check on all shop proof load test weights that accomplished the task in one-eighth the time normally required. Sgt Raymond has received High Qualified ratings from 3901 SMES and an error-free rating from the SAC Inspector General. Additionally, he was acknowledged by the SAC Inspector General for his combined effort in the renovation of the proof load test facility and battery van box.

TSgt James F. Raymond

Munitions Maintenance

A1C Joseph Dovel, 42 BMW, Loring AFB, is SAC's Munitions Airman of the Month. Assigned as a weapons loading technician, A1C Dovel's talents in loading, configuration of aircraft and maintenance of the weapons system and associated equipment are second to none. His outstanding loading knowledge resulted in his selection as a member of the loading team mobilized to Moron AB, Spain, in support of Busy Brewer 86A. That TDY was a resounding success with over 10 tons of MK-52 conventional mine munitions being dropped on target with a 100 percent reliability rate and demonstrated the ability of a joint Air Force and Navy venture. During the last two MSET visits, A1C Dovel loaded MK-86SE weapons on a multiple ejector rack and MK-52 mines for external carriage. Airman Dovel performed error-free operations which resulted in "excellent" ratings for the loading portion of MSET both times.

A1C Joseph Dovel

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tion. This reduces the amount of the boom that is hanging in the slipstream, which in turn reduces the amount of drag on the tanker. As a result, the tanker increases airspeed slightly and the receiver moves aft. When the receiver reaches 15 feet, he will move down to 30 degrees elevation and stabilize at 16 feet. The receiver will then go down to 38 degrees elevation, putting more of the boom in the slipstream, which in turn puts more drag on the tanker. Yes, you guessed it, the tanker slows down and the receiver starts to move forward. When the receiver reaches 9 feet, he will move up to 30 degrees elevation and stabilize at 8 feet. All of this movement was accomplished without any changes in throttle position on the tanker or receiver.

So what's this got to do with "real" refueling? How many receiver pilots tend to come in low during night refueling? It's a tendency that many receiver pilots have because there are fewer visual cues available at night to aid in recognizing the effect of the tanker's downwash. The problem with this situation is that it could set you up for trouble. If the receiver comes in low, the boom operator may have a tendency to start lowering the boom in anticipation of the receiver reaching the contact position. To make things worse, the receiver may stagnate somewhere between 10-20 feet and add just "a little bit" of power to get through "the downwash." The result is a fast closure rate that is hard to see at night. How many times have you gotten a contact at night and almost immediately received a "back 2, back 4" correction from the boom operator? Sound familiar?

This same effect could affect your limits demo's when demonstrating the upper and lower elevation limits. If you stay at an upper or lower limit for any length of time to point out references, don't forget what the boom position is doing to you, especially on lower limits!

Well, that's about it on boom effects. The secret to staying ahead of these effects is realizing that they exist, and what they are trying to do to you. Booms, keep your pilot informed of the receiver's position, both prior to and during contact. Receiver pilots, realize that it may not be all your fault! Some of the problems that you may be experiencing during A/R may be a combination of these effects. Tanker pilots, be aware of what that "secondary flight control" can do to you and be ready to correct for it.

If nothing else, you can use this information to impress your new Second Lieutenant copilot when you tell him all about the "magic" of boom effects! **Fly safe.**

About the author. After completing boom school at Castle AFB, TSgt Radvanyi was assigned to the 509 AREFS at Pease AFB. He was selected to be a CCTS flightline instructor at the 93 AREFS, Castle AFB in December 1982. TSgt Radvanyi spent two and a half years on the flightline instructing CCTS students before he was selected to be a SAC CFIC instructor in July 1985.

The Silent Giants

This year we will see a changing of the guard. While new weapon systems take their place in SAC's front line of deterrence, the last Titan II intercontinental ballistic missile will be removed from the alert force.

The Titan II weapon system has always been a reliable and powerful deterrent force. It has quietly stood as a symbol of our determination and desire to maintain peace in the world. It has seen many missiliers come and go and has given to each of them a testimony of what mankind can accomplish and to what extent he is willing to go to maintain the freedoms we enjoy so much. It has also been a witness to us that a weapon system is only as reliable and safe as those who operate and maintain it.

As demonstrated by the mishaps at Rock, Kansas and Damascus, Arkansas, there is no room for error! Mishaps don't just happen, they are often caused when a job becomes "routine," carelessness replaces concentration and shortcuts replace checklists.

When deactivation began, a lot of attention was focused on the critical tasks involved in dismantling and removing this silent giant. This attention has helped us do the job correctly and safely — as we have for over two decades. As this tasks extends into months and years there is the danger of it becoming too routine. As we get closer to the point of being able to say, "Mission complete!", it becomes even more important to focus our attention on the job at hand.

Career changes, PCS moves, retirement and many other thoughts go through our minds as we contemplate the future, and they tend to distract us from the here and now. We must remember the Titan II is and continues to be a powerful and potentially dangerous weapon system, not only to our adversaries, but also to us. We cannot afford to relax and allow the job to become routine. There really is no room for error!

So until the last one of these giants is quietly put to rest, let's do our jobs and do them correctly. Let the Titan II weapon system be remembered as one that silently kept peace in the world.

MSgt Leo Schrubb
3901 SMES, Vandenberg

About the author. MSgt Schrubb (SMSgt selectee) is currently assigned to the 3901 SMES as a Titan operations evaluator. He has over 16 years experience both as an instructor and evaluator in the Titan weapon system.

SAC SAFETY SCREEN

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW AFR 127-2/SS1*.

524 BMS, Wurtsmith Crew S-20: IP Maj Thomas R Baker, CP Capt David A Bowie, IR Capt Douglas P Grajczyk, NN Capt Andrew S Knapp, EW Capt Samuel A Fusco, IG SSgt Randy E McFadden

920 AREFS, Wurtsmith Crew S-143: FP Capt David S Caldwell, CP 1Lt James H Morrill, NN 1Lt Steven T Fisher, BB SSgt Gary L Davis

920 AREFS, Wurtsmith Crew S-130: IP Capt Patrick T O'Brien, CP Capt Daniel B Smith, IN Capt Margaret A Glasgow, IB SSgt Thomas Weirauch

91 AREFS, McConnell Crew E-111: P Capt Peter M Wilson, CP 1Lt Christopher N Wheatley, N 1Lt David C Ham, BO Sgt Harvey J Schneider

384 AREFS, McConnell Crew R-158: Maj C. Terry Anderson, CP 1Lt Robert E Parker Jr, 1Lt Charles R Mayberry, BO Sgt Michael J Perry

380 AREFS, Plattsburgh Crew R-122: P Capt Bryon E Thom, CP 1Lt Thomas D Makowski, N 1Lt Kenneth H Jepson, BO SSgt Lynn E Sturgill

128 AREFG, Gen Mitchell Fld, Milwaukee, WI: P Lt Col John E. Bailey, IP Lt Col Robert G. Harshaw, N Lt Col Arthur R. Thompson, Jr., IBO MSgt Lee S. Cornell

351 SMW, Whiteman Crew R-081: MCCC 1Lt John F Corrigan, DMCCC 2Lt Paul M Nordhaus

351 SMW, Whiteman Crew R-103: MCCC Capt Ronald A Doby, DMCCC 2Lt Charles A Stottlar

90 SMW, Minot Crew R-152A: MCCC 1Lt Steven V Gilliken, DMCCC 1Lt Roger D Juntunen

44 SMW, Ellsworth Crew R-083: MCCC 1Lt Timothy NeSmith, DMCCC 2Lt Brian J Butterworth

321 SMW, Grand Forks Crew R-041: MCCC 1Lt Patrick R Phelps, DMCCC 2Lt Pedro Torres

9 AREFS, March Crew B-023: AC Capt Richard V Copley, CP 1Lt Steven J Tasson, FE TSgt Ronald M Davis, BO TSgt Jeffrey McGirt

9 AREFS, March Crew E-051: AC Maj Herman D Ross, CP Capt Terrance R McCabe, FE TSgt Jimmy E Brevard, BO TSgt Steven J Oothoudt

24 SRS, Eielson Crew R-05: IP Maj Ronald B Pless, CP Capt Robert A Nemeth, Nav-1 Capt James L Marsden Jr, Nav-2 Capt Scott J Odgen

24 SRS, Eielson Crew E-145: ITC Capt Raymond W Erickson Jr, Raven-1 1Lt Ralph Ah Sam, Raven-2 1Lt David C Flynn, Raven-3 Capt Alan T Berryman, Raven-4 Capt Everett L Iler, ET TSgt Marcus L Forbes, PT SSgt William R Bodine

22 AREFS, March Crew S-102: IP Capt Stephen J Schwartz, CP Capt Michael J Iacampo, IN Capt Bruce A Prentice, IBO SSgt Robert L Durbin

22 AREFS, March Crew R-121: IP Capt Leroy B Dunkelberger, CP 1Lt George M Lorenzo, N Capt Eric D Karge, IBO SSgt Derek T Suficiencia

The captions underneath the photos of the Bartsch ECM Trophy and the LeMay Bombing Trophy winners were inadvertently switched in our December issue. Combat Crew regrets the error.

WANTED

Editor for Combat Crew Magazine

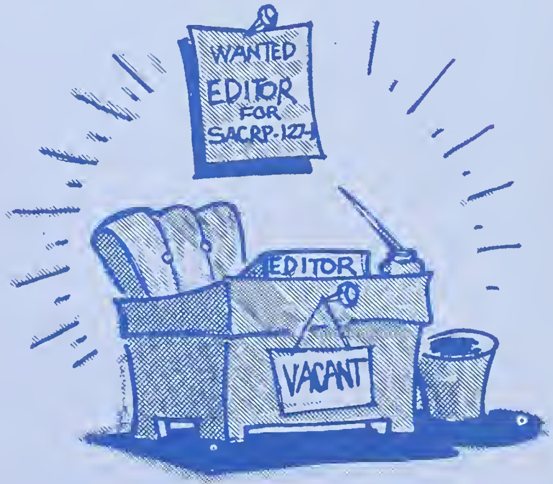
Situation: Our editor has been selected for promotion and will complete his tour this summer.

Job Description: Chief, Safety Education Division, HQ SAC/IGFE. In addition to editorial duties, you will also manage the SAC Safety Awards and Recognition Program and be the project officer for the annual SAC Safety Management Course.

Requirements: Senior Captain or Major, pilot, and although journalism experience would be beneficial, it is not required.

Apply: If you're interested in a challenging, one of a kind position call Maj Bob Neidrick, AV 271-6221/2620.

When: Plan to arrive at Offutt in mid June.



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FLARE

HALL OF FAME

OVER THIRTY YEARS

170 AREFG, McGuire (NJANG)	Feb. '56

OVER TWENTY-EIGHT YEARS

171 AREFW, Greater Pittsburgh (PAANG)	Mar. '58
157 AREFG, Pease (NHANG)	Jun '58

OVER TWENTY-SEVEN YEARS

940 AREFG, Mather (USAFR)	May '59

OVER TWENTY-FIVE YEARS

151 AREFG, Salt Lake City (UTANG)	Feb. '61

OVER TWENTY-FOUR YEARS

11 SG, Fairford	Feb '62
134 AREFG, McGhee Tyson (TNANG)	Mar '62
340 AREFW, Altus	Jun '62
96 BMW, Dyess	Aug. '62

OVER TWENTY-TWO YEARS

160 AREFG, Rickenbacker (OHANG)	Dec. '64

OVER TWENTY-ONE YEARS

320 BMW, Mather	Jul '65

OVER TWENTY YEARS

452 AREFW, March (USAFR)	Sept '66

OVER NINETEEN YEARS

55 SRW, Offutt	Jul '67
2 BMW, Barksdale	Aug '67

OVER SEVENTEEN YEARS

5 BMW, Minot	Feb. '69
141 AREFW, Fairchild (WAANG)	Oct '69

OVER SIXTEEN YEARS

28 BMW, Ellsworth	May '70

OVER FOURTEEN YEARS

101 AREFW, Bangor (MEANG)	Mar '72
306 SW, Mildenhall	Apr '72
416 BMW, Griffiss	May '72

OVER THIRTEEN YEARS

379 BMW, Wurtsmith	Apr '73

OVER TWELVE YEARS

931 AREFG, Grissom (USAFR)	Feb '74
384 AREFW, McConnell	Mar '74
189 AREFG, Little Rock (ARANG)	May '74
43 SW, Andersen	Dec '74

OVER ELEVEN YEARS

68 AREFG, Seymour Johnson	Sep '75

OVER NINE YEARS

410 BMW, K.I. Sawyer	Apr '77
190 AREFG, Forbes (KSANG)	Apr '77
128 AREFG, Milwaukee (WIANG)	Jul '77

OVER SEVEN YEARS

376 SW, Kadena	Aug '79

OVER SIX YEARS

7 BMW, Carswell	Jul '80
319 BMW, Grand Forks	Sept '80
380 BMW, Plattsburgh	Oct '80

OVER FIVE YEARS

97 BMW, Blytheville	Jan '81
22 AREFW, March	Oct '81

ICBM

OVER FOURTEEN YEARS

321 SMW, Grand Forks	Aug '72

OVER TWELVE YEARS

351 SMW, Whiteman	Oct '74
91 SMW, Minot	Nov '74

OVER EIGHT YEARS

44 SMW, Ellsworth	Nov '78

OVER SEVEN YEARS

90 SMW, F.E. Warren	Dec '79

OVER SIX YEARS

308 SMW, Little Rock	Sept '80

To gain listing in the Hall of Fame, a SAC or ARF unit must be Class A mishap-free for 48 months.